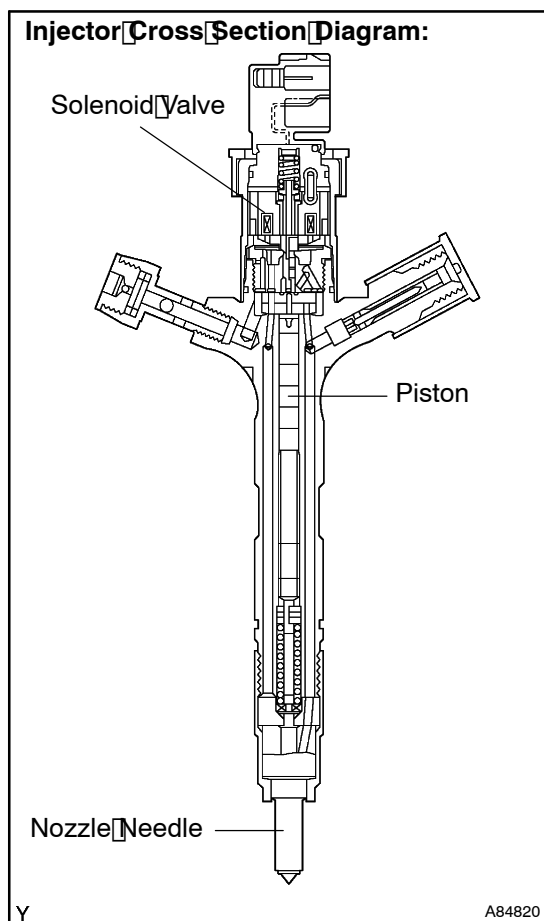


DTC**P1238****INJECTOR MALFUNCTION****HINT:**

- For more information on the injector and the common rail system, see page 05-432.
- If P1238 is present, refer to the diagnostic trouble codes (DTCs) table for the fuel system on page 05-432.

CIRCUIT DESCRIPTION

The ECM detects combustion deterioration for a specific cylinder.

HINT:

- The cylinder, which has the compensation value for Revised Injection Volume #1, #2, #3 and #4 that varies from other cylinders, may be malfunctioning.
- If DTC P0093 (Fuel leaks in high-pressure area) is present simultaneously, a leakage malfunction of the cylinder probably be occurred.
- If DTC P0200 (Open or short in EDU or injector circuit) is present simultaneously, there is probably a faulty circuit located between the ECM and the injector including the EDU.
- If only DTC P1238 (Injector malfunction) is present, probably an injector mechanical malfunction or insufficient compression (valve clearance etc) has occurred, not an open or short malfunction of the ECM, EDU or injector circuit.

DTC No.	DTC Detection Condition	Main Trouble Area	Related Trouble Area
P1238	Engine speed fluctuation is large when idling (2 trip detection logic)	<ul style="list-style-type: none"> • Injector • EDU (P0200 is set simultaneously) • Open or short in engine wire harness (P0200 is set simultaneously) • Connector connection (P0200 is set simultaneously) • Compression pressure • Valve clearance 	<ul style="list-style-type: none"> • Valve timing • ECM

HINT:

When DTC P1238 is detected, check the internal fuel pressure by selecting Powertrain / Engine and ECT / Data List / Common Rail Pressure on the intelligent tester II.

Reference:

Engine Speed	Fuel Pressure (MPa)
Idling	Approximately 20 to 40
2,500 rpm (No engine load)	Approximately 40 to 80

MONITOR DESCRIPTION

P1238 (Injection malfunction, exclude open or short in injector circuit):

This DTC is set if the engine speed fluctuation between each cylinder is large. The ECM monitors changes in the crankshaft rotation speed using the crankshaft position sensor for detecting poor combustion. Also, it identifies a faulty cylinder using the camshaft position sensor. The fluctuation counter increments when irregular crankshaft rotation speed variation exceeds the threshold when idling. Therefore, if either one of the cylinders has very poor combustion (rough idling), the ECM sets this DTC.

MONITOR STRATEGY

Required sensors	Crankshaft position sensor
Frequency of operation	Continuous
Duration	10 minutes
MIL operation	2 driving cycles

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
Engine	At idling	
Engine speed	500 rpm	–
Engine coolant temperature	20°C (68°F)	–

TYPICAL MALFUNCTION THRESHOLDS

Threshold
The number of irregular changes in the crankshaft rotation speed

HINT:

The number of irregular changes in the crankshaft rotation speed indicates the insufficient combustion.

WIRING DIAGRAM

Refer to DTC P0200 on [page 05-499](#).

INSPECTION PROCEDURE

HINT:

- If DTCs other than P1238 are present simultaneously, first troubleshoot them.
- Read freeze frame data using the intelligent tester II. Freeze frame data record the engine condition when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, if the engine was warmed up or not, and other data from the time the malfunction occurred.

1	CHECK OTHER DTC OUTPUT (IN ADDITION TO DTC P1238)
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- Connect the intelligent tester II to the DLC3.
- Turn the ignition switch to ON and turn the intelligent tester II ON.
- Select the following menu items: Powertrain / Engine and ECT / DTC.
- Read DTCs.

Result:

Display (DTC Output)	Proceed To
P1238	A
P1238 and other DTCs	B

HINT:

If any DTCs other than P1238 are output, troubleshoot those DTCs first.

B

GO TO RELEVANT DTC CHART
(See page 05-458)

A

2 CHECK WIRE HARNESS AND CONNECTOR IN ENGINE ROOM

HINT:

Check the wire harness and connector connections.

NG

REPAIR OR REPLACE

OK

3 READ VALUE OF INTELLIGENT TESTER II (COMPENSATION OF INJECTION VOLUME BETWEEN CYLINDERS FOR IDENTIFYING MALFUNCTION CYLINDER)

- Connect the intelligent tester II to the DLC3.
- Turn the ignition switch to ON and turn the intelligent tester II ON.
- Select the following menu items: Powertrain / Engine and ECT / Data List / Revised Injection Volume #1, #2, #3 and #4.
- Read the value.

Standard:

Result	Compensatory Injection Volume (mm ³)
Standard	4.9 or less

HINT:

The compensation injection value is usually 3.0 mm³ or less.

- The cylinders that have the compensation value which is higher than the standard value shown above are considered to be faulty cylinders. Use the following steps to inspect and repair the cylinders.

Result:

Result	Proceed To
Faulty cylinder is not identified	A
Faulty cylinder is identified	B

B

Go to step 5

A

4 PERFORM ACTIVE TEST BY INTELLIGENT TESTER II (INJECTION CUT FOR IDENTIFYING MALFUNCTION CYLINDER)

- Connect the intelligent tester II to the DLC3.
- Start the engine and turn the intelligent tester II ON.
- Select the following menu items: Powertrain / Engine and ECT / Active Test / Injector cut #1, #2, #3 and #4.
- Check the four cylinders in sequence to identify a faulty cylinder by performing the power-balance inspection.

HINT:

If the engine idling remains normal despite cutting off the fuel injection, the cylinder is malfunctioning.

GO

5 **CHECK CYLINDER COMPRESSION PRESSURE OF MALFUNCTION CYLINDER**
(See page 14-72 of Pub. No. RM864E AVENSIS VERSO/ PICNIC REPAIR MANUAL)

NG **REPAIR OR REPLACE**

OK

6 **CHECK VALVE CLEARANCE OF MALFUNCTION CYLINDER**
(See page 14-76 of Pub. No. RM864E AVENSIS VERSO/ PICNIC REPAIR MANUAL)

NG **ADJUST VALVE CLEARANCE**
(See page 14-76 of Pub. No. RM864E AVENSIS VERSO/ PICNIC REPAIR MANUAL)

OK

7 **CHECK IF DTC OUTPUT RECURS (DTC P1238)**

HINT:

After clearing the DTC, let the engine idle for 10 minutes after warming up, and then confirm that P1238 is not set again.

OK **CHECK FOR INTERMITTENT PROBLEMS**
(See page 05-440)

NG

8 **REPLACE INJECTOR ASSY**
(See page 11-22 of Pub. No. RM864E AVENSIS VERSO/ PICNIC REPAIR MANUAL)

GO

CHECK IF DTC OUTPUT RECURS (DTC P1238)

HINT:

After clearing the DTC, let the engine idle for 10 minutes after warming up, and then confirm that P1238 is not set again.